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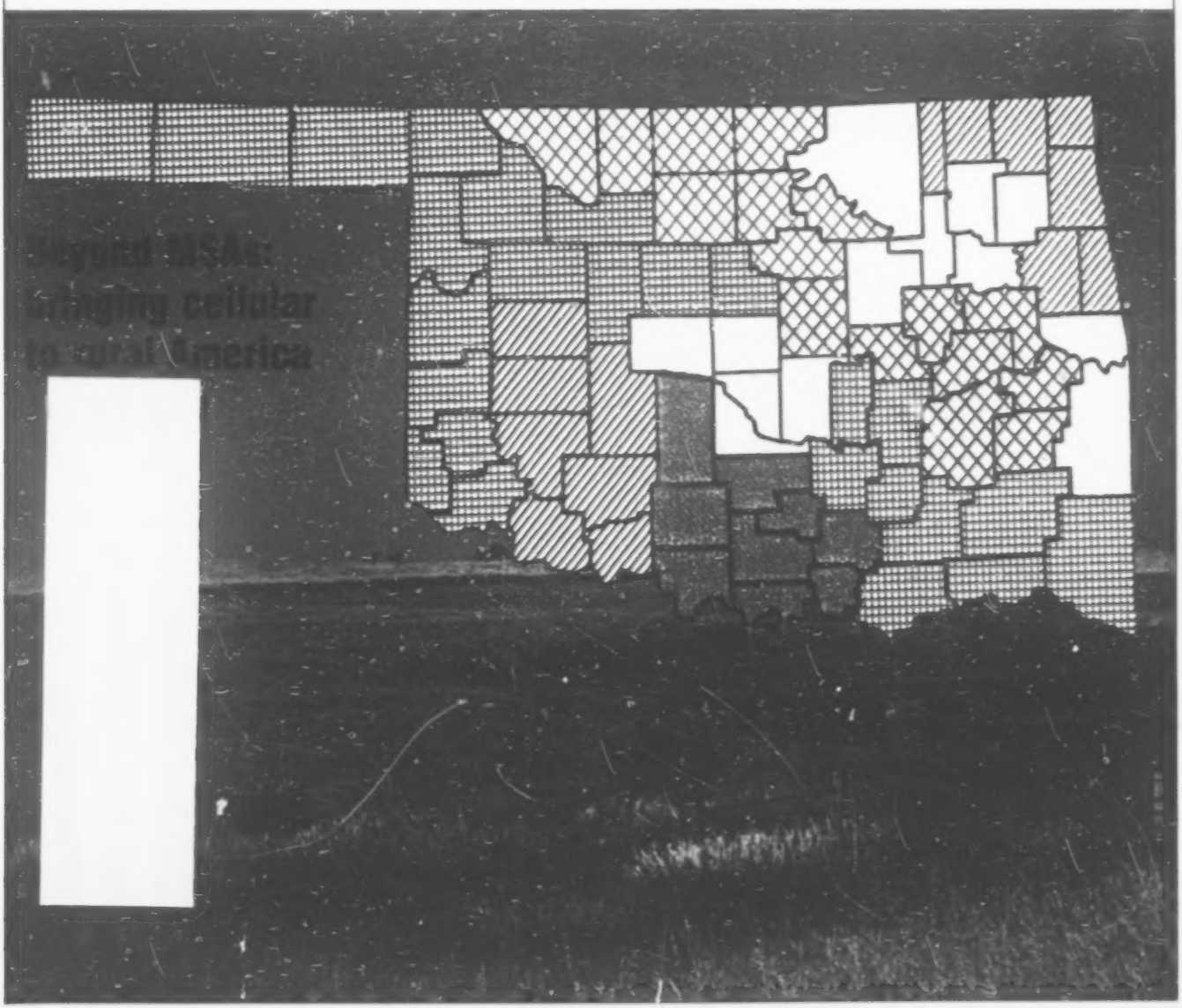

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Beyond MSAs: Bringing cellular service to rural America

EDWARD W. TOWERS

SUDDENLY RURAL areas are becoming "hot" commodities in the cellular mobile phone business. Areas outside the metropolitan statistical areas (MSAs) contain only 24% of the U.S. population but represent 84% of U.S. geography.

MSAs are defined according to a set of detailed standards prepared by the Federal Committee on MSAs and are based on entire counties, except in New England. There are 305 MSAs that qualify by being a city of at least 50,000 people or an urban area of at least 50,000 with a total metropolitan population of at least 100,000 (Table 1). Non-MSAs are areas that are not included in any of the 305 MSAs.

The Federal Communications Commission (FCC) is granting licenses for cellular service in the large cities first. To date, only the top 90 markets have been settled; applications have been received and accepted by the FCC for MSAs 91-120. It has taken the FCC over a year to accept applications for this last tier of 30 markets.

Why are we discussing non-MSAs when there are still 215 MSAs yet to be filed? It is true that, in general, non-MSA markets are not as valuable as MSAs. In addition, current FCC rules would settle the non-MSA markets some years in the future.

One might suppose that these rural areas should be a low priority. But the cellular business is a vibrant and dynamic industry in which methods and priorities change daily. There are very valid reasons why non-MSAs are now being discussed.

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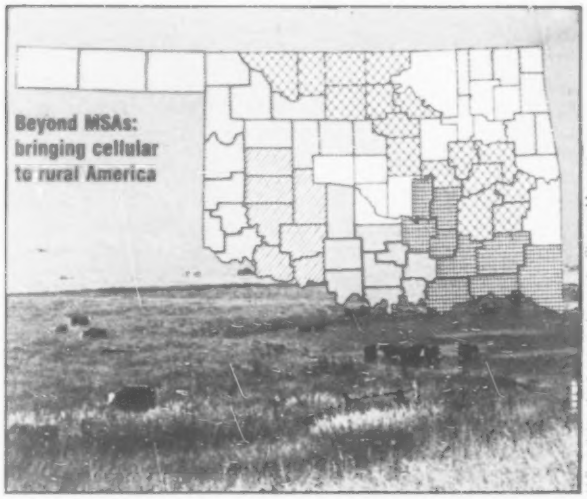
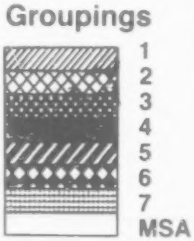
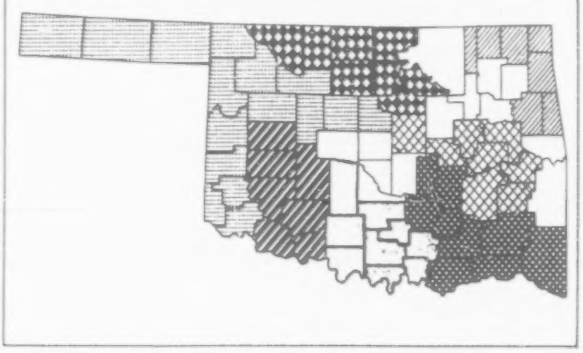
The controversy still stands on how to bring cellular service to sparsely populated areas.



U.S. cellular chart, cover design by Sharon Marjack

Figure 1
Proposed Non-MSA Cellular Serving Area





The FCC ruled that cellular system operators may provide fixed (not mobile or portable) cellular service on an incidental basis. This was the result of a concept, articulated by Bill West of Westcom, of providing fixed cellular service in rural America now—not waiting for all MSAs to be built first. Metro Mobile CTS has also petitioned the FCC, asking that 14 mile wide non-MSA corridors be allowed between developed MSAs within 75 miles of each

FCC update: revising the non-MSA rules

THE FEDERAL Communications Commission (FCC) is quickly moving to revise its rules on non-MSA markets. Areas outside the metropolitan statistical areas (MSAs) and New England County metropolitan statistical areas (NECMAs) have attracted intense interest lately from rural telcos.

In December, the commission adopted a proposal to divide each state into non-MSA markets along county lines (TELEPHONY, Dec. 23, 1985, p. 16). The plan, presented by United TeleSpectrum, would create an average of eight markets per state with about 150,000 people in each. The commission chose as an alternative a plan offered by Telephone and Data Systems, Inc. (TDS). The TDS proposal would divide states along county lines to produce an average of 6.7 markets per state with an average population of 200,000. The FCC is soliciting comments, due by Feb. 1, on both plans.

The FCC also recently rejected a proposal made by Metro Mobile CTS that would have allowed cellular operators in MSA markets to connect their systems via corridors through non-MSA markets. The commission opined that this plan might delay the licensing of the remaining MSA markets.

other. This would allow operators of cellular systems in the large cities to "creep" out along interstates into rural areas. Both proposals focus on how cellular systems will be built in rural America.

Another reason for the interest in rural areas is that the current cellular operators want to provide cellular to collar counties. Collar counties are non-MSA counties that are contiguous to the counties constituting the MSA. In fact, some operators are already providing cellular service outside of the MSA into collar counties. This is annoying to the telcos with presence that are considering providing cellular in these areas in the future.

Actually, rural areas are where telcos can realize the greatest savings by providing cellular. This is because of the high cost to wire POTS (plain old telephone service) in locations with low population density.

Rural America doesn't want to wait until all 305 MSAs are settled before it can be introduced to this exciting new technology. Farmers know about the growth in the cellular industry: Like their city cousins they read newspapers which forecast 2.6 million cellular subscribers by 1990. And suburbanites, for their part, don't want to be denied cellular services just because they live 10 miles outside the city.

Finally, the development of non-MSA cellular systems will add to the value of MSAs. This is because of the prevalence of roamer (or, as we call them, "homer") arrangements between operators in different markets. Roaming allows a cellular subscriber to use a unit when away from the home system. With 80 cellular systems now built, roaming becomes a significant source of incremental revenue to cellular operators.

Back in June 1985, as part of a task force headed by the United States Telephone Assn., two questions were asked. Should the present non-MSA rules be changed by the FCC? And if so, what criteria should be used to define non-MSA areas?

The current FCC rules for non-MSA filings call for separate wireline and non-wireline filings to be made on some unspecified date in 1986 or later. Each telco with presence will be allowed a single filing, not to exceed 2000 square miles, and must list the major towns in the filing area. Non-MSAs that attract multiple filings will be settled by lottery or by voluntary settlement between the interested parties. Finally, all non-MSA geography not filed for will be made available for a second round of filing at a later date.

Unclear boundaries

There are many problems created by these rules. Filers can design their own non-MSA filing area. Consequently, there is no standard for defining these areas. MSAs, on the other hand, have easily understood boundaries. The lack of a common definition for non-MSA coverage makes it hard for operators to plan systems in these markets. It will be almost impossible to settle a non-MSA market if multiple, overlapping and different-shaped coverage areas are allowed. For example, an out-of-state telco 200 miles away could fulfill the 2000-square mile requirement by filing for a 200-mile-long, 10-mile-wide area. Yet such a filing might cover an exchange that the local telco plans to serve.

Many of the non-MSA areas will probably not receive cellular because

the filers will design their filings to cover only those territories they perceive to be of high value. The filers naturally will ignore unprofitable areas. Indeed, some potential 2000 square mile non-MSA areas will be more valuable than some of the smaller MSAs. Alton/Granite City, Ill., which is MSA 305, has only 20,538 residents, according to the 1980 census. Many 50 by 40 square mile areas outside of cities have stronger market demographics than the Alton/Granite City area.

Selling to people, not acreage

The biggest problem with the present rule is that common sense tells us that telcos sell to people, not square mileage. Population density is what matters to the telco. The FCC's existing 2000 square mile maximum is not, in general, large enough to be economically feasible. This is particularly true for stand-alone cellular installations. The average density of non-MSAs is 18 people per square mile. A maximum filing would contain only 36,000 people on average. If an operator does not have enough of a potential market to draw on for sales, it cannot expect to make a profit and it will not build. It is critical that non-MSA areas be of sufficient size to be economically viable.

TDS/U.S. Cellular concludes that the existing non-MSA rules must be changed. Now, what should those new rules be?

To answer this question, TDS evaluated mapping alternatives. There are many different ways to establish geographic boundaries. Zip codes are common but they are too small to be useful and change too often. Telephone exchanges are frequently used in telephony but again are too small to serve the purpose of the cellular industry. In addition, nobody outside of the telephone industry cares about telephone exchanges, nor can much marketing information be gathered that is exchange-specific.

TDS looked at eight alternatives. The first alternative was to group counties along corridors—highways—until a target total of about 50,000 people was reached. The second, third and fourth alternatives were likewise based on country lines going along corridors until approximately 100,000, 150,000 and 200,000 people, respectively, were gathered. TDS sampled seven states for the first and second alternatives and 11 states for the third and fourth alternatives. Many iterations had to be made before each state balanced out and made sense. Alternative number 5 was based on local access and transport (LATA) boundaries, while number 6 was based on area codes. Option number 7 involved taking 10 purely arbitrary slices through a state to determine the average, or arithmetic, mean. Option 8 was the base case of the current 2000 square mile rule.

The results for each alternative are shown in Table 2. The first alternative resulted in an average of 24 non-MSA groupings per state, each with an average of 1631 miles. This is less than the present FCC rule will allow. In the second, third and fourth alternatives, the number of groupings per state goes down and the average number of square

Continued on page 70

Table 1 Market Population by Tier*

Market Tier	1980 Population	Average Population
1-30	91,971.9	3,065.7
31-60	23,580.4	786.0
51-90	15,859.0	528.6
Total	**131,411.3 (58%)**	
91-120	10,151.9	338.4
121-150	7,938.8	264.6
151-180	6,238.6	207.9
181-210	4,512.9	150.4
211-240	4,069.0	135.6
241-270	3,464.7	115.5
271-305	3,002.7	100.1

Population Totals

MSAs	**170,789.9**
United States	**226,549.0**
Non-MSAs	**55.759.1**

*Excludes Puerto Rico

How big is big enough?

HOW MANY subscribers does a cellular system need to be economically viable? United States Cellular, a TDS unit, examined the question in the following way.

Assuming a cellular system costs $300,000 per site, each site will require 100 subscribers paying an average monthly bill of $100. Since a single cellular site covers, approximately, a 25 mile diameter, its radius (r) is 12.5 miles; the number of square miles covered can be computed by $\Pi x r^2$, or 3.1416 x 12.5^2. Thus, each cell can serve approximately 490.8 square miles. For example, a 10-cell system will cost about $3 million, serve about 4908 square miles and require a minimum of 1000 subscribers.

United States Cellular argues that, as a rule of thumb, cellular operators can hope to gain 1% of the population as subscribers within 5 years. Therefore, to reach a target of 1000 subscribers, a base population of 100,000 is needed. Of course, competition with a non-wireline operator changes the numbers. If the non-wireline takes 50% of the telco's cellular business, a base population of 200,000 is needed to support the telco's 10-cell system.

Continued from page 32

miles goes up proportionately. We discarded LATA and area codes as a means of dividing the non-MSAs because they are too large, frequently taking up a whole state.

The real question is: How many people are needed to support a cellular system? It is a balance between total population, total square miles, and pockets or corridors that have more population than average. If it takes 200,000 people to support a system, but an operator must go to 50,000 square miles to get that population, he will have defeated his purpose. It would be too expensive to cover all that land.

After we studied these results, we still were not satisfied with any of the eight alternatives. It occurred to us that the smaller-size MSAs really have the same problem. Many of the smaller MSAs probably will not support a stand alone cellular system. The last tier of markets has an average population of only 100,000.

Combine non-MSAs and MSAs

We, therefore, considered combining the non-MSA areas with the smaller MSAs. TDS's recommendation, now before the FCC, is to group counties along corridors until the target of 200,000 people is reached and to include those counties that make up MSAs 211-305. MSA 211 had a 1980 population of only 148,442. Small cities thus become the core of non-MSA areas. We used Rand McNally Basic Trading Areas as a guide in developing boundaries. This allowed each grouping to keep its common business or trading sphere of influence. All 50 states have now been mapped with this new alternative. The results are 336 total areas nationally for an average of 6.7 groupings per state. Excluding Alaska, the average is 7467 square miles per group (Table 3).

Additionally, TDS recommends that the percentage of the cellular geographic serving area that the operator has to cover be a minimum of 40% of population living in the area by the third year and 60% by the seventh year after the covering license is granted. This will require cellular operators to serve a substantial portion of the areas.

In the filing we have included computer generated and color-coded state maps depicting the proposed new cellular service areas. The maps are individually coded per page in color to designate each service area within a state. For instance, consider the case of Oklahoma (Figure 1). There are seven non-MSA groupings in Oklahoma. The areas that are not colored are counties of MSAs 1-210. The small MSAs of Enid (MSA 302) and Lawton (MSA 260) are part of groupings 6 and 5, respectively. The filing also includes a binder of supporting information with details of each county and grouping, tabbed by state.

One concern that has been mentioned relative to the TDS proposal is that it affects agreements that might already be in place in the MSA markets beyond 211. Any proposal establishing common definition of cellular service areas for these markets will impact such agreements and may be modified. The key is that cellular areas need to be technically and financially viable or any agreement is of little value.

The major advantage of our proposal is that more of rural America will be served with cellular technology. The serving areas have a sufficient population base to support at least one cellular system, are built around corridors and many have a small MSA as their core. The beneficiaries of the proposal will be rural America and the people traveling through these areas.

Our proposal provides a great improvement over the unworkable present definition and a way to define economically viable cellular service areas. It also assures the maximum possible service to rural areas with the natural participation of small and rural telephone companies. It represents a solution to small MSAs as well as the creation of rural cellular opportunities. □

Table 2 Results of Initial Eight Alternatives

Alternative	Total non-MSA areas	Average non-MSA areas per state	Average square miles/area	Actual average population/area
1. 50,000 pop. (7 states)*	171	24	1631	60,297
2. 100,000 pop. (7 states)*	98	14	2890	106,668
3. 150,000 pop. (11 states)*	93	8	3670	148,866
4. 200,000 pop. (11 states)*	69	6	4842	197,136
5. LATA (2 states)*	3	1.5	16,409	442,508
6. NPA (2 states)	3	1.5	16,409	442,508
7. 10 Arbitrary slices (3 states)	3	10	4111	109,357
8. 2000 sq. mi. (7 states)*	41	6	2000	157,964

* Vermont and New Hampshire are combined as one state.

Table 3 TDS's Proposal for Redefining Non-MSA Areas

Proposal: Combine non-MSA counties and MSAs 211-305 going along corridors, using Basic Trading Areas as a guide.

Total non-MSA areas	Average non-MSA areas/state	Average square miles/area	Actual average population/area
336	6.7	7467*	195,692

*Alaska not included.